CLAIMS

1. A curable organopolysiloxane resin composition for optical transmission components comprising (A) an organopolysiloxane resin, which is represented by the average unit formula (1):

$(R^1_3SiO_{1/2})_a(R^2_2SiO_{2/2})_b(R^3SiO_{3/2})_c(SiO_{4/2})_d$ (1)

(wherein R^1, R^2, and R^3 stand for one, two, or more kinds of monovalent hydrocarbon groups selected from monovalent aliphatic hydrocarbon groups having 1~6 carbon atoms and monovalent aromatic hydrocarbon groups having 6~10 carbon atoms, $0<a\leq0.5$, $0\leq b<0.2$, $0.3\leq c<1$, $0\leq d\leq0.4$, $0\leq(b+d)/(a+c)\leq0.25$, and $a+b+c+d=1$)and has three or more monovalent unsaturated aliphatic hydrocarbon groups per molecule, with not less than 10 mol% of the monovalent hydrocarbon groups being monovalent aromatic hydrocarbon groups, (B) an organosilicon compound having two or more silicon-bonded hydrogen atoms per molecule, with not less than 5 mol% of all the silicon-bonded monovalent substituent groups being monovalent aromatic hydrocarbon groups, and (C) a hydrosilation catalyst.

2. The curable organopolysiloxane resin composition for optical transmission components according to claim 1, wherein the viscosity of the composition is not more than 1×10^7 mPa·s at 25°C.

3. A curable organopolysiloxane resin composition for an optical transmission component comprising (A) an organopolysiloxane resin, which is represented by the average unit formula (1):

$(R^1_3SiO_{1/2})_a(R^2_2SiO_{2/2})_b(R^3SiO_{3/2})_c(SiO_{4/2})_d$ (1)

(wherein R^1, R^2, and R^3, a, b, c, d, (b+d)/(a+c), and a+b+c+d are the same as above) and has three or more monovalent unsaturated aliphatic hydrocarbon groups per molecule, with not less than 10 mol% of the monovalent hydrocarbon groups being monovalent aromatic hydrocarbon groups, (B) an organosilicon compound having two or more silicon-bonded hydrogen atoms per molecule, with not less than 5 mol% of all the silicon-bonded monovalent substituent groups being monovalent aromatic hydrocarbon groups, (C) a hydrosilation catalyst, and (D) (d1) a solvent or (d2) a hydrosilation-reactive organosiloxane-based diluent.

4. An optical transmission component comprising a hydrosilation-cured product of (A) an organopolysiloxane resin, which is represented by the average unit formula (1):

$(R^1_3SiO_{1/2})_a(R^2_2SiO_{2/2})_b(R^3SiO_{3/2})_c(SiO_{4/2})_d$ (1)

(wherein R^1, R^2, and R^3 stand for one, two, or more kinds of monovalent hydrocarbon groups selected from monovalent aliphatic hydrocarbon groups having 1~6 carbon atoms and

monovalent aromatic hydrocarbon groups having 6~10 carbon atoms, $0<a\leq 0.5$, $0\leq b<0.2$, $0.3\leq c<1$, $0\leq d\leq 0.4$, $0\leq(b+d)/(a+c)\leq 0.25$, and $a+b+c+d=1$) and has three or more monovalent unsaturated aliphatic hydrocarbon groups per molecule, with not less than 10 mol% of the monovalent hydrocarbon groups being monovalent aromatic hydrocarbon groups, and (B) an organosilicon compound having two or more silicon-bonded hydrogen atoms per molecule, with not less than 5 mol% of all the silicon-bonded monovalent substituent groups being monovalent aromatic hydrocarbon groups.

5. An optical transmission component comprising a hydrosilation-cured product of (A) an organopolysiloxane resin, which is represented by the average unit formula (1):
$(R^1{}_3SiO_{1/2})_a(R^2{}_2SiO_{2/2})_b(R^3SiO_{3/2})_c(SiO_{4/2})_d$ (1)
(wherein R^1, R^2, R^3, a, b, c, d, $(b+d)/(a+c)$, and $a+b+c+d$ are the as described above) and has three or more monovalent unsaturated aliphatic hydrocarbon groups per molecule, with not less than 10 mol% of the monovalent hydrocarbon groups being monovalent aromatic hydrocarbon groups, (B) an organosilicon compound having two or more silicon-bonded hydrogen atoms per molecule, with not less than 5 mol% of all the silicon-bonded monovalent substituent groups being monovalent aromatic hydrocarbon groups, and (d2) a hydrosilation-reactive organosiloxane-based diluent.

6. The optical transmission component according to claim 4, wherein the optical transmission component is an optical waveguide.

7. The optical transmission component according to claim 5, wherein the optical transmission component is an optical waveguide.

8. The optical transmission component according to claim 6, wherein both the cladding and the core of the optical waveguide consist of a hydrosilation-cured product of component (A) and component (B), with the refractive index of the core being at least 0.1% higher than the refractive index of the cladding.

9. The optical transmission component according to claim 7, wherein both the cladding and the core of the optical waveguide consist of a hydrosilation-cured product of component (A), component (B), and component (d2), with the refractive index of the core being at least 0.1% higher than the refractive index of the cladding.

10. The optical transmission component according to claim 8, wherein the refractive index difference is regulated by making the total content of monovalent aromatic hydrocarbon groups in component (A) and component (B) used for the core higher than the total content

of monovalent aromatic hydrocarbon groups in component (A) and component (B) used for the cladding.

11. The optical transmission component according to claim 9, wherein the refractive index difference is regulated by making the total content of monovalent aromatic hydrocarbon groups in component (A), component (B), and component (d2) used for the core higher than the total content of monovalent aromatic hydrocarbon groups in component (A), component (B), and component (d2) used for the cladding.

12. The optical transmission component according to any of claim 4 ~ claim 11, which has a film-like shape.

13. A process for fabricating an optical transmission component, wherein the curable organopolysiloxane resin composition for optical transmission components according to any of claim 1~claim 3 is cured by heating.

14. A process for fabricating an optical transmission component, wherein the curable organopolysiloxane resin composition for an optical transmission component according to any of claim 1~claim 3 is applied to a substrate and cured by heating.

15. A process for fabricating a slab optical waveguide, in which a curable organopolysiloxane resin composition for optical transmission components (1) according to any of claim 1~claim 3 is applied to a substrate and cured by heating, a curable organopolysiloxane resin composition for optical transmission components (2), whose cured product has a refractive index at least 0.1% higher than that of the above-mentioned composition (1), is applied to the cured product thereof and cured by heating, whereupon the aforementioned composition (1) is applied to the cured product thereof and cured by heating.

16. A process for fabricating an optical transmission component, wherein the curable organopolysiloxane resin composition for optical transmission components according to any of claim 1~claim 3 is casted into a mold having a desired inner surface shape and cured by heating.

17. A process for fabricating an optical transmission component, wherein ① a curable organopolysiloxane resin composition for optical transmission components (3) according to any of [1]~[3] is cast into a mold having on its inner surface protrusions corresponding to the core and cured by heating, ② the molding is removed from the mold, ③ a curable organopolysiloxane resin composition for optical transmission components (4) according to any of [1]~[3], whose cured product has a refractive index at least 0.1% higher than that of

the aforementioned composition (3), is cast into the hollow portion of the cured product removed from the mold and cured by heating, whereupon ④ the aforementioned composition (3) is applied on top of the cured product of the aforementioned composition (4) and the cured product of the aforementioned composition (3) and cured by heating.

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